

RETRACTABLE LUGGAGE WHEEL

RELATED APPLICATIONS

[0001] This application claims priority to Chinese Patent Application Number 03219909.0 filed February 14, 2003.

FIELD

[0002] The present invention relates to luggage generally and more particularly to carry-on luggage.

BACKGROUND

[0003] Articles of luggage, such as suitcases, are often outfitted with wheels. The luggage wheels enable a traveler to move the luggage more easily because he or she can roll the luggage rather than carry the luggage. Conventionally, the luggage wheels extend out from the surface of the luggage and cannot be retracted. Because the wheels cannot be retracted, the luggage requires more space for storage than would be required if the luggage did not have wheels. In the case of carry-on luggage, the extra space required due to the unretractable wheels may necessitate that the luggage be checked onto the back of the plane rather than fitting into the more convenient overhead bins in the cabin of the plane. Checking the luggage onto the plane creates additional hassles for the traveler and requires additional time. Another problem with the conventional luggage wheels is that they may break more easily because they do not retract. Thus, a retractable luggage wheel is needed.

SUMMARY

[0004] The present invention addresses the disadvantages of the prior art by providing a retractable luggage wheel control mechanism that is easy to operate. The control mechanism is for use on all types of luggage, including carry-on luggage.

[0005] A retractable luggage wheel control mechanism (control mechanism) is for use on all types of luggage (containers), including carry-on luggage. In one embodiment of the

present invention, movement of a luggage handle (handle) controls the extension and retraction of the luggage wheel.

[0006] In one embodiment of the present invention, the control mechanism includes a luggage wheel, a wheel housing, the luggage handle, a slide, and a plurality of springs. The luggage handle may include a pair of telescoping luggage handle shafts, i.e. a left handle shaft and a right handle shaft. Each telescoping luggage handle shaft may include an inner handle shaft and an outer handle shaft. A spring fits inside of the slide. More specifically, the spring fits inside a space on the inside of the slide and attaches to a hook connected to the luggage body. Other springs fit on both sides of the wheel housing.

[0007] The top surface of the slide has a top incline surface that slidingly couples with the bottom end of the handle shaft, i.e. the inner handle shaft. The bottom surface of the inner handle shaft may have a handle contact structure to press against and slidingly couple with the top incline surface of the slide. The handle contact structure may be composed of wire and plastic. The bottom surface of the slide has a bottom incline surface to slidingly couple with the top of the wheel housing. A slide cover attaches to the luggage surface to cover and protect the slide.

[0008] The disclosed control mechanism provides for easy extension and retraction of luggage wheels. The luggage wheels move in response to compression and expansion of the luggage handle. That is, when the handle is compressed, the wheels extend; and when the handle is expanded, the wheels retract. The movement of the wheels is thus controlled automatically by the operation of the handle. The control mechanism provides for easier luggage handling and storage.

DESCRIPTION OF THE DRAWINGS

[0009] Figure 1 depicts a frontal view of a disassembled control mechanism;

[0010] Figure 2 depicts a frontal view of an assembled control mechanism;

[0011] Figure 3 depicts a cut-away view of the control mechanism in a “wheel-in” position; and

[0012] Figure 4 depicts a cut-away view of the control mechanism in a “wheel-out”

position.

DETAILED DESCRIPTION

[0013] A retractable luggage wheel control mechanism (control mechanism) is for use on all types of luggage (containers), including carry-on luggage. In one embodiment of the present invention, movement of a luggage handle controls the extension and retraction of the luggage wheel.

[0014] In one embodiment of the present invention, the control mechanism includes a luggage wheel, a wheel housing, the luggage handle, a slide, and a plurality of springs. The luggage handle may include a pair of telescoping luggage handle shafts, i.e. a left handle shaft and a right handle shaft. Each telescoping luggage handle shaft may include an inner handle shaft and an outer handle shaft. The luggage handle may be comprised of a plurality of pipes or any other type of shaft structure. A spring fits inside of the slide. More specifically, the spring fits inside a space on the inside of the slide and attaches to a hook connected to the luggage body. Other springs fit on both sides of the wheel housing.

[0015] The top surface of the slide has a top incline surface that slidingly couples with the bottom end of the handle shaft, i.e. the inner handle shaft. The bottom surface of the inner handle shaft may have a handle contact structure to press against and slidingly couple with the top incline surface of the slide. The handle contact structure may be composed of wire and plastic. The bottom surface of the slide has a bottom incline surface to slidingly couple with the top of the wheel housing. A slide cover attaches to the luggage surface to cover and protect the slide.

[0016] Referring now to the figures, the control mechanism includes the wheel 3, the wheel housing 2, the slide 4, the wheel outside cover 14, slide springs 5, wheel springs 6, and the telescoping luggage handle shaft 7. A luggage body 1 houses the control mechanism as well as provides space for clothing or other articles to be stored.

[0017] Referring now to Figures 1 and 2, the wheel outside cover 14 attaches at a side of the bottom surface of the luggage body. A wheel hole 11 is bored in the center of the wheel outside cover to allow the wheel to travel in and out. The wheel outside cover protects the outer surface of the luggage body, i.e. leather or fabric. The wheel outside cover also provides

a rigid, flat surface on which to stand and balance the luggage body.

[0018] The luggage body includes a hollow space 12 to house the slide, the wheel housing, and the telescoping luggage handle shaft.

[0019] Referring now to Figures 3 and 4, the telescoping luggage handle shaft includes the inner handle shaft 72 and the outer handle shaft 71. The bottom end of the inner shaft may include the handle contact structure 721 to press against and slidably couple to the top incline surface 41 of the slide.

[0020] Referring again to Figure 1, the wheel housing holds the wheel so that the wheel may roll about an axle. The top on the wheel housing may have a convex wheel housing contact member 231 to press against and slidably couple to the bottom incline surface 42 of the slide. A pair of the wheel springs 6 fit into the spring holes 16 on the luggage body (depicted by the pair of dotted lines shown in Figure 1). A pair of wheel spring caps 8 fit over the wheel springs.

[0021] Referring again to Figures 3 and 4, the slide holds the slide spring 5 that couples to the hook 51. The top surface of the slide has the top incline surface to slidably couple to the handle shaft contact member. The bottom surface of the slide has the bottom incline surface to slidably couple to the convex wheel housing contact member. The bottom incline surface may be part of a slide notch 421 into which the convex wheel housing contact member fits when the control mechanism is in a “wheel in” position. The slide cover 13 attached to the luggage body covers and protects the slide.

[0022] Referring now to Figure 4, the control mechanism is depicted in a “wheel-in” position. When the telescoping luggage handle shaft is compressed, i.e. when the handle is pressed into the luggage, the inner handle shaft slides more deeply into the outer handle shaft. The handle contact structure at the bottom end of the inner handle shaft presses against and slidably couples to the top incline surface of the slide, thereby moving the slide out of a slide hole 411 in the outer handle shaft. The slide moves outward, away from the center of the luggage body in response to the pressure applied by the handle contact structure. As the slide moves outward, the convex wheel housing contact member slidably couples to the bottom incline surface of the slide and gradually fits into the slide notch, under the force applied by the

pair of wheel springs. As the convex wheel housing contact member fits into the slide notch, the wheel is retracted.

[0023] Referring now to Figure 3, the control mechanism is depicted in a “wheel-out” position. When the telescoping luggage handle shaft is expanded, i.e. when the handle is pulled out of the luggage, the inner handle shaft is withdrawn from within the outer handle shaft. The handle contact structure at the bottom end of the inner handle shaft is removed from contact with the slide and moves up the outer handle shaft. Because of the movement of the handle contact structure up the outer handle shaft, the slide hole 411 is cleared and the top incline surface of the slide moves through the slide hole due to the force applied by the expansion of the slide spring. Due to the inward movement of the slide, the peak of the convex wheel housing contact member (horizontal peak area) is brought into contact with the low point of the slide notch. In one aspect of the invention, the peak of the convex wheel housing contact member and the low point of the slide notch are both flat, horizontal surfaces. The bringing into contact of the peak of the convex wheel housing contact member with the low point of the slide notch causes the wheel housing to move downward. The downward movement of the wheel housing causes the wheel to extend, i.e. to move outward from the bottom surface of the luggage.

[0024] Having disclosed exemplary embodiments and the best mode, modifications and variations may be made to the disclosed embodiments while remaining within the subject and spirit of the invention as defined by the following claims.